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EXAMINER	
MOORE, IAN N	
ART UNIT	PAPER NUMBER
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/821,981	Applicant(s) ONG ET AL.	
	Examiner Ian N. Moore	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-61 and 63-69* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *57-61 and 63* is/are allowed.

6)☒ Claim(s) *1-23,25-31,33-56 and 64-69* is/are rejected.

7)☒ Claim(s) *24 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 21 is objected to because of the following informalities:

Claim 21 recites, "…**said** sets of channels…" in lines 10 and 11. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether "said of channels" refers to "set of working channels" (in line 8) or "a set of protection channels" (in line 8). *Note- this issues is raised in the previous action.*

Claim 21 recites, " **they**" in line 12. It is unclear whether "they" refers to "set of channels" in line 11, "a first connection configuration", or "a second connection configuration" in line 10.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1-8,17-23,25-31,33-56, and 64-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura (US005517489A) in view of Kawaguchi (US006977889B1).

Regarding Claim 1, Ogura discloses an apparatus (see FIG. 1) comprising:

a network element (see FIG. 1, Node A; and also see FIG. 4, SDH 2-fiber ring optical multiplexing device) to be coupled to a first (see FIG. 1, span between Node A and D on west

side) and second span (see FIG. 1, span between Node A and B on east side) of a plurality of spans that interconnect a set of network elements (see FIG. 1, spans between Node A-D) to form a ring network (see FIG. 1, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30),

each of said plurality of spans having two sub-spans (see FIG. 2 or 4; E/O 3 of transmit span and O/E 4 of receive span; see col. 6, lines 25-40; see col. 7, lines 20-25) on which traffic travels in opposite directions (see FIG. 6, transmit and receives traffic travels in clockwise/counterclockwise direction; see col. 6, lines 41-57; see col. 7, lines 46-55) on a plurality of channels that circumvent said ring (see FIG. 1, Time slots TS#K), each said plurality of channels including working channels and protecting charnels (see FIG. 6, n and m time slots), said network element including,

a traffic handler (see FIG. 4, a combined system of Receiving Control 11, transmitting control 12 and add/drop multiplexing 9 and 10) to reprogram, responsive to protection switches and un-switches (see col. 7, lines 6-12,20-45), the connection configuration on the protecting channels of the sub-spans of the first and second spans that provide traffic to the network element (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; note that when the protection channels are utilized (e.g. m<n or m>n) when a failure occurs/clears),

wherein a given connection configuration (see FIG. 6, configuration/connection of n and m time slots) is to identify one or more components within the protecting channels (see col. 7, line 42-65; see col. 8, lines 15-33; see col. 9, lines 35-42; identifying n or m timeslots/channel within protecting channel for when failure occurs/clears).

Ogura does not explicitly disclose one or more concatenations and where a given concatenation of components is to collectively carry data for a single circuit at a greater bandwidth than that of data carried by a single component.

However, protection channels/time-slots carries one or more concatenations (e.g. STS-Nc) and where a given concatenation of components (e.g. STS-12c, where N=12) is to collectively carry data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit) at a greater bandwidth (e.g.OC-12 line rate of 622.08 Mb/s) than that of data carried by a single component (e.g. single STS-1 (i.e. OC-1 at line rate 51.81 Mb/s)) is <u>well known in the art of SONET/SDH</u> standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein a given connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) is to identify one or more concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c) of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) within the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10), where a given concatenation of components (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) is to collectively carry data for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into <u>one</u> STS-48c, STS-24c, STS-12c, or STS3c circuit) at a greater bandwidth (see FIG. 8, greater OC-48 line rate at 2488.32 Mb/s, OC-24 line rate at 1244.16 Mb/s, OC-12 line rate at 622.08 Mb/s, and/or OC-13 line rate at 51.81 Mb/s) than that of data carried by a single component (see FIG. 8, a single

channel STS-1 (i.e. OC-1 at line rate 51.84 Mb/s)); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) .

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Ogura, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Regarding Claim 17, Hermann discloses an apparatus (see FIG. 1) comprising:

a network element (see FIG. 1 and 17, Node A; and also see FIG. 4, SDH 2-fiber ring optical multiplexing device) to be coupled to a first (see FIG. 1, span between Node A and D on west side) and second span (see FIG. 1, span between Node A and B on east side) of a BLSR ring (see FIG. 6, a ring that switches lines in both East and West (clockwise and counterclockwise) direction; see col. 7, lines 42-63)), said network element including,

means for providing different connection configurations on the protecting channels of said first and second spans (see FIG. 4, a combined system of Receiving Control 11, transmitting control 12 and add/drop multiplexing 9 and 10) responsive to protection switches and un-switches (see col. 7, lines 6-12,20-45; see col. 7, lines 26-50,60 to col. 8, lines 30; also see col. 3,

lines 20-65; note that when the protection channels are utilized (e.g. m<n or m>n) when a failure occurs/clears);

wherein a different connection configuration (see FIG. 6, different configuration/connection of n and m time slots) capable to identify one or more different components within the protecting channels (see col. 7, line 42-65; see col. 8, lines 15-33; see col. 9, lines 35-42; identifying n or m timeslots/channel within protecting channel for when failure occurs/clears).

Ogura does not explicitly disclose concatenations and where a different concatenation each to carry data for a single circuit at a greater bandwidth than that of data carried by a single component.

However, protection channels/time-slots carries one or more concatenations (e.g. STS-Nc) and wherein different connection configurations (e.g. STS-12c, where N=12) capable to identify different concatenations each to carry data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit) at a bandwidth greater (e.g.OC-12 line rate of 622.08 Mb/s) than that of data carried by a single component (e.g. single STS-1 (i.e. OC-1 at line rate 51.81 Mb/s)) is well known in the art of SONET/SDH standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein said different connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) capable to identify different concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c; see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10) each to carry data (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into

one STS-48c, STS-24c, STS-12c, or STS3c circuit) with a bandwidth greater (see FIG. 8, greater OC-48 line rate at 2488.32 Mb/s, OC-24 line rate at 1244.16 Mb/s, OC-12 line rate at 622.08 Mb/s, and/or OC-13 line rate at 51.81 Mb/s) than that of data carried by a single component (see FIG. 8, a single channel STS-1 (i.e. OC-1 at line rate 51.84 Mb/s)); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) of the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Ogura, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Regarding Claim 21, Ogura discloses an apparatus (see FIG. 1) comprising:

a plurality of network elements (see FIG. 1, Node A-D; and also see FIG. 4, SDH 2-fiber ring optical multiplexing devices);

a plurality of spans interconnecting said plurality of network elements (see FIG. 1, spans between Node A-D) to form a ring (see FIG. 1, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30),

each of said plurality of spans having two sub-spans (see FIG. 2 or 4; E/O 3 of transmit span and O/E 4 of receive span; see col. 6, lines 25-40; see col. 7, lines 20-25) on which traffic travels in opposite directions (see FIG. 6, transmit and receives traffic travels in clockwise/counterclockwise direction; see col. 6, lines 41-57; see col. 7, lines 46-55);

a multiplexing ring transport network protocol operating on said ring (see FIG. 4, a combined system of add/drop multiplexing 9 and 10, Receiving Control 11, and transmitting control 12) providing a plurality of channels on each of said sub-spans (see FIG. 1, Time slots TS#K), each of said plurality of channels includes a set of working channels and a mutually exclusive set of protecting channels charnels (see FIG. 6, n and m time slots),

wherein a first connection configuration programmed on a first of said sets of channels is not the same as a second connection configuration programmed on a second of said sets of channels (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; note that when the working channels are not the same as protection channels (e.g. m<n or m>n)) because

they (see FIG. 6, configuration/connection of n and m time slots) identify one or more components within the protecting channels (see col. 7, line 42-65; see col. 8, lines 15-33; see col. 9, lines 35-42; identifying n or m timeslots/channel within protecting channel for when failure occurs/clears).

Ogura does not explicitly disclose one or more different concatenations of two or more components, where each of the concatenations of components carries data for a single circuit at a bandwidth greater than that of data carried by a single component.

However, protection channels/time-slots carries one or more different concatenations (e.g. STS-Nc) of two or more components of set of channels (e.g. STS-12c, where N=12), where

each of the concatenation of components carries data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit) at a bandwidth greater (e.g.OC-12 line rate of 622.08 Mb/s) than that of data carried by a single component (e.g. single STS-1 (i.e. OC-1 at line rate 51.81 Mb/s)) is <u>well known in the art of SONET/SDH</u> standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches a connection configuration of sets of channels (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) identify one or more different concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c) of two or more components of said sets of channels (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) within the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10), where each of the concatenation of components (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) carries data for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into <u>one</u> STS-48c, STS-24c, STS-12c, or STS3c circuit) at a bandwidth greater (see FIG. 8, greater OC-48 line rate at 2488.32 Mb/s, OC-24 line rate at 1244.16 Mb/s, OC-12 line rate at 622.08 Mb/s, and/or OC-13 line rate at 51.81 Mb/s) than that of data carried by a single component (see FIG. 8, a single channel STS-1 (i.e. OC-1 at line rate 51.84 Mb/s)); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) .

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1

channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Ogura, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Regarding Claim 34, Ogura discloses an apparatus (see FIG. 1) comprising:

a plurality of network elements (see FIG. 1, Node A-D; and also see FIG. 4, SDH 2-fiber ring optical multiplexing devices);

a plurality of spans interconnecting said plurality of network elements (see FIG. 1, spans between Node A-D) to form a ring (see FIG. 1, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30),

each of said plurality of spans including two sub-spans (see FIG. 2 or 4; E/O 3 of transmit span and O/E 4 of receive span; see col. 6, lines 25-40; see col. 7, lines 20-25), said sub-spans forming two sub-rings (see FIG. 1, clockwise ring and counterclockwise ring; see col. 6, lines 41-57; see col. 7, lines 46-55), wherein a plurality of channels circumvent said ring on each of said sub-rings (see FIG. 1, Time slots TS#K), each of said plurality of channels including working channels and protecting channels (see FIG. 6, n and m time slots); and

a traffic handler (see FIG. 4, a combined system of Receiving Control 11, transmitting control 12 and add/drop multiplexing 9 and 10) on each of said plurality of network elements that together reprogram the connection configurations (see col. 7, lines 6-12,20-45) of the protecting channels on at least certain of said sub-spans responsive to protection switches and

un-switches (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; note that when the protection channels are utilized (e.g. m<n or m>n) when a failure occurs/clears).

wherein a connection configuration (see FIG. 6, configuration/connection of n and m time slots) identify different components of the protecting channels (see col. 7, line 42-65; see col. 8, lines 15-33; see col. 9, lines 35-42; identifying n or m timeslots/channel within protecting channel for when failure occurs/clears).

Ogura does not explicitly disclose concatenations and where each of the concatenation of components carries data for a single circuit.

However, protection channels/time-slots carries different concatenations (e.g. STS-Nc) and where a different concatenation of two or more components (e.g. STS-12c, where N=12) carries data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit)) is <u>well known in the art of SONET/SDH</u> standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein the connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) identify different concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c) of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) of the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10), where each of the concatenation of components (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) carries data for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into <u>one</u> STS-48c, STS-24c, STS-12c, or

STS3c circuit); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) .

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Ogura, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Regarding Claim 46, Ogura discloses a method (see FIG. 12-15, method) comprising:

responsive to a failure (see col. 7, lines 1-25; see FIG. 11, Fault) in a span in a ring network (see FIG. 1 and 11, SDH 2-fiber ring optical network), indicating a protection switch to occur on said ring network (see col. 7, lines 1-25), wherein said ring network operates on a plurality of network elements (see FIG. 1 and 11, Nodes A-D or N1-N6) that participate as nodes of said ring network and that are connected by spans (see FIG. 1 and 11, spans between Nodes A-D or N1-N6) to form a ring (see FIG. 1 and 11, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30),

each of said plurality of spans including two sub-spans (see FIG. 2 or 4; E/O 3 of transmit span and O/E 4 of receive span; see col. 6, lines 25-40; see col. 7, lines 20-25) on which traffic

travels in opposite directions (see FIG. 6, transmit and receives traffic travels in clockwise/counterclockwise direction; see col. 6, lines 41-57; see col. 7, lines 46-55) on a plurality of channels (see FIG. 1, Time slots TS#K), each of said sub-spans coupled to a receiving side (see FIG. 2 or 4; O/E 4 and 1 of receive ports) and a transmitting side of ports on two different ones of said nodes (see FIG. 2 or 4; E/O 3 and 2 of transmit ports), said plurality of channels in each direction including a set of working channels and a set of protecting channels (see FIG. 6, n and m time slots); and

responsive to said protection switch, programming the receiving side of those of said ports that are coupled to operable sub-spans so that their protection channels have programmed thereon the connection configuration of the working channels programmed on the opposite direction sub-spans of said failed span (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; see col. 9, lines 5-65; during protecting switching, the working channels are protected by the protecting channels so that the traffic can be routed in opposite direction away from the failure);

wherein the connection configuration (see FIG. 6, configuration/connection of n and m time slots) identifies one or more components within the protecting channels (see col. 7, line 42-65; see col. 8, lines 15-33; see col. 9, lines 35-42; identifying n or m timeslots/channel within protecting channel for when failure occurs/clears).

Ogura does not explicitly disclose a combination of a signal component, and a concatenation of two or more components or a combination of multiple concatenations of tow or more components, where each concatenation carries data for a different single circuit.

However, protection channels/time-slots carries a combination of a signal component (e.g. a single STS-1), and a concatenation of two or more components (e.g. STS-12c, where N=12 (i.e. 12 STS-1 channels/components)) or a combination of multiple concatenations of two or more components (e.g. two concatenate STS-12c, each contains 12 STS-1 channels/components), where each concatenation carries data for a different single circuit (e.g. 1st concatenated STS-12c carries first OC-12 circuit, and 2nd concatenated STS-12c carries second OC-12 circuit) is well known in the art of SONET/SDH standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches a combination of a signal component (see col. 6, line 55 to col. 7, line 44; a single STS-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10; and a concatenation of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) or a combination of multiple concatenations of two or more components (see FIG. 8, two STS-48c, four STS-24c, eight STS-12c, and thirty-two STS-3c, each contains at least three STS-1 channel/components), where each concatenation carries data for a different single circuit (see FIG. 8, each STS-48c, STS-24c, STS-12c, and STS-3c carries OC-48,OC-24,OC-12 and OC-3 circuit, respectively); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration identifies a signals STS-1 channel/component and a concentration of three or more STS-1 channel/components in STS-Nc (where N= N=3,12,24, or 48), or a combination of multiple STS-Nc with each STS-Nc has at least three STS-1 channel/components, where each STS-Nc carries data for its corresponding

STS-Nc circuit, as taught by Kawaguchi in the system of Ogura, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Regarding Claim 64, Ogura discloses machine-readable medium providing instructions that, when executed by a set of one or more processors, cause said set of processor to perform operations (see FIG. 12-15, method) comprising:

receiving, at a node (see FIG. 1 and 11, Node A-D or N1-N6) of a ring network (see FIG. 1 and 11, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30), a first message (see FIG. 11, command I) indicating a protection switch (see col. 9, lines 48-65; see col. 12, lines 30-55),

wherein said ring network operates on a plurality of network elements that participate as nodes (see FIG. 1 and 11, Node A-D or N1-N6) of said ring network and that are connected by a plurality of spans (see FIG. 1 and 11, spans between Nodes A-D or N1-N6) to form a ring (see FIG. 1 and 11, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30), each span including two sub-spans (see FIG. 2 or 4; E/O 3 of transmit span and O/E 4 of receive span; see col. 6, lines 25-40; see col. 7, lines 20-25) on which traffic travels in opposite directions (see FIG. 6, transmit and receives traffic travels in clockwise/counterclockwise direction; see col. 6, lines 41-57; see col. 7, lines 46-55) on a plurality of channels (see FIG. 1,

Time slots TS#K), said plurality of channels in each direction including a set of working channels and a set of protecting channels (see FIG. 6, n and m time slots); and

responsive to said first message, reprogramming a receiving side of a first port of said node (see FIG. 2 or 4; O/E 4 and 1 of receive ports) coupled to one of said sub-spans so that its protecting channels have programmed thereon the connection configuration of the working channels programmed on the opposite direction sub-span of a span identified by said first message (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; see col. 9, lines 5 to col. 10, lines 40; protecting switching in accordance with command I);

wherein the connection configuration (see FIG. 6, configuration/connection of n and m time slots) identifies one or more components within the protecting channels (see col. 7, line 42-65; see col. 8, lines 15-33; see col. 9, lines 35-42; identifying n or m timeslots/channel within protecting channel for when failure occurs/clears).

Ogura does not explicitly disclose a combination of a signal component, and a concatenation of two or more components or a combination of multiple concatenations of tow or more components, where each concatenation carries data for a different single circuit. However, protection channels/time-slots carries a combination of a signal component (e.g. a single STS-1), and a concatenation of two or more components (e.g. STS-12c, where N=12 (i.e. 12 STS-1 channels/components)) or a combination of multiple concatenations of two or more components (e.g. two concatenate STS-12c, each contains 12 STS-1 channels/components), where each concatenation carries data for a different single circuit (e.g. 1st concatenated STS-12c carries first OC-12 circuit, and 2nd concatenated STS-12c carries second OC-12 circuit) is <u>well known in the art of SONET/SDH</u> standards (GR-253-CORE; sections 3.1 and 3.2.3). In

particular, Kawaguchi teaches a combination of a signal component (see col. 6, line 55 to col. 7, line 44; a single STS-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10; and a concatenation of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) or a combination of multiple concatenations of two or more components (see FIG. 8, two STS-48c, four STS-24c, eight STS-12c, and thirty-two STS-3c, each contains at least three STS-1 channel/components), where each concatenation carries data for a different single circuit (see FIG. 8, each STS-48c, STS-24c, STS-12c, and STS-3c carries OC-48,OC-24,OC-12 and OC-3 circuit, respectively); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration identifies a signals STS-1 channel/component and a concentration of three or more STS-1 channel/components in STS-Nc (where N= N=3,12,24, or 48), or a combination of multiple STS-Nc with each STS-Nc has at least three STS-1 channel/components, where each STS-Nc carries data for its corresponding STS-Nc circuit, as taught by Kawaguchi in the system of Ogura, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Regarding Claims 2, 35, 38 and 40, Ogura discloses responsive to a protection switch, two different connection configurations are programmed on the protecting channels of the sub-spans of the first and second spans that provide traffic to the network element (see FIG. 6 and 11, due to SDH protection switching (i.e. APS switching), protection channels (where m<n or m>n) are used in clock/counterclockwise direction in East (i.e. first connection) and west side (i.e. second connection) of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10). Note that a sub-ring is a collective of spans (i.e. a combined span between node A-B and A-C), thus the same rejection applies to the sub-ring.

Regarding Claim 3, 36, 37 and 39, Ogura discloses responsive to a protection switch, the same connection configuration is programmed on the protecting channels of the sub-spans of the first and second spans that provide traffic to the network element (see FIG. 6 and 11, due to SDH protection switching (i.e. SONET/SDH APS switching), the same protection channels (where m=n) are used in clock/counterclockwise direction in East and west side of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10. Note that sub-ring is a collective of spans (i.e. a combined span between node A-B and A-C, thus the same rejection applies to the sub-ring.

Regarding Claim 4, Ogura discloses responsive to a protection un-switch, two different connection configurations are programmed on the protecting channels of the sub-spans of the first and second spans that provide traffic to the network element (see FIG. 6 and 11, due to SDH protection un-switching (i.e. SONET/SDH <u>reverted</u> APS switching), protection channels (where m<n or m>n) used in clock/counterclockwise direction in East (i.e. first connection) and west

side (i.e. second connection) of the network element would have been reverted into prior (to the failure) configuration; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claims 5 and 50, Ogura discloses responsive to a protection un-switch, the same connection configuration is programmed on the protecting channels of the sub-spans of the first and second spans that provide traffic to the network element (see FIG. 6 and 11, due to SDH protection un-switching (i.e. SONET/SDH reverted APS switching), the same protection channels (where m=n) used in clock/counterclockwise direction in East and west side of the network element would have been reverted into prior (to the failure) configuration; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10.

Regarding Claims 6 and 45, Ogura discloses wherein said traffic handler includes a connection table generator (see FIG. 17, time slots/channels table; also see FIG. 20, traffic control table; see col. 11, lines 52 to col. 12, lines 9; see col. 15, lines 36-45) to communication connection configuration information (see FIG. 11, command I) with others of said plurality of network elements (see FIG. 1, 11, and 17; communicate with other nodes; see col. 9, lines 48-65; see col. 12, lines 30-55).

Regarding Claims 7, 33, 43,52, and 69, Ogura discloses wherein said ring network is a modified bi-direction lines switched ring (see FIG. 6, a ring that switches lines in both East and West (clockwise and counterclockwise) direction with channels m>n, m>n, or m=n; see col. 7, lines 42-63).

Regarding Claims 8 and 42, Ogura discloses wherein said network element further includes: a first set of structures (see FIG. 17, 1st and last column of time slots/channels table, spans A-B and C-A) to store the connection configurations programmed on the working and

protecting channels of the sub-spans of the first and second spans that provide traffic to the network element (see col. 11, lines 52 to col. 12, lines 9; also see FIG. 20, traffic control table; see col. 15, lines 36-45); and

a second set of structures (see FIG. 17, 2nd column of time slots/channels table, B-C, for remote span B-C not directly connected to node A) to store the connection configurations programmed on the working channels of those of said plurality of spans not directly connected to the network element (see col. 11, lines 52 to col. 12, lines 9; also see FIG. 20, traffic control table; see col. 15, lines 36-45).

Regarding Claim 18, Ogura discloses said means allows a first of said plurality of channels (see FIG. 6 and 11, protection and working channels) to be part of two different sized connections programmed on said first and second spans (see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10; different sizes channels, $m<n$ or $m>n$, are used in clock/counterclockwise direction in East and west side of the network element).

Regarding Claim 19, Ogura discloses where said means allows said first spans to have programmed thereon a concatenation of a plurality of the BLSR channels that is not programmed on said second span (see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10; channels, $m<n$ or $m>n$, (where $n + m$ time slots can be either working channels or protection channels), thus when $m>n$, m channels in the bidirectional ring are used in clockwise/East side, which are <u>not</u> used in counterclockwise/west side of the network element. In SDH/SONET concatenation is a group of channels, and thus m channels are concatenated channels.)

Regarding Claim 20, Ogura discloses a storage means (see FIG. 17, time slots/channels table and see FIG. 20, traffic control table) for storing said different connection configurations (see col. 11, lines 52 to col. 12, lines 9; see col. 15, lines 36-45); and

a hardware control means (see FIG. 4, a combined system of Receiving Control 11, transmitting control 12 and add/drop multiplexing 9 and 10) for programming counterclockwise direction in East and west side of the network element (see col. 6, lines 41-57; see col. 7, lines 46-55; see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; see FIG. 6, transmit and receives traffic travels in clockwise/counterclockwise direction; see col. 6, lines 41-57; see col. 7, lines 46-55).

Regarding Claim 22, Ogura discloses wherein said first set of channels and said second set of channels are respectively the set of working channels and the set of protecting channels on a same one of said sub-spans (see FIG. 6, see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; both working and protection channels are on the same direction clockwise/counterclockwise).

Regarding Claims 23 and 53, Ogura discloses the same connection configuration must be programmed on each of said sets of working channels (see FIG. 6 and 11, for SDH protection switching (i.e. SONET/SDH APS switching), the same working (and protection) channels (where m=n) are used; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claims 25 and 54, Ogura discloses wherein the same connection configurations must be programmed on the set of working channels of both sub-spans of any given one of said spans (see FIG. 6 and 11, for SDH protection switching (i.e. SONET/SDH APS switching), the same working (and protection) channels (where m=n) are used in East/west

direction; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10), and wherein the connection configurations programmed on the sets of working channels of two different ones of said spans differ (see FIG. 6 and 11, for SDH protection switching (i.e. SONET/SDH APS switching), the different working (and protection) channels (where m>n or m<n) are used in West/east direction; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10.)

Regarding Claims 26 and 55, Ogura discloses wherein the connection configurations programmed on the sets of working channels of two different ones of said spans differ, and wherein the connection configurations programmed on the set of working channels of each of the sub-spans of at least one of said spans differ (see FIG. 6 and 11, for SDH protection switching (i.e. APS switching), working channels (where m<n or m>n) are used in clock/counterclockwise direction in East (i.e. first one) and west side (i.e. second one) of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claim 27, Ogura discloses wherein said first set of channels and said second set of channels are the sets of working channels on two different ones of said sub-spans (see FIG. 6 and 11, for SDH protection switching (i.e. APS switching), working channels (where m<n or m>n) are used in clock/counterclockwise direction in East (i.e. first one) and west side (i.e. second one) of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claim 28, Ogura discloses wherein said two different ones of said sub-spans are part of a same one of said spans (see FIG. 6 and 11; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10; both O/E and E/O sub-spans for clockwise/counterclockwise directions are in the same span between two nodes).

Regarding Claim 29, Ogura discloses wherein said two different ones of said sub-spans are part of a two different ones of said spans (see FIG. 6 and 11; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10; both East/west O/E and West/east E/O sub-spans for clockwise/counterclockwise directions are in the different span between two nodes).

Regarding Claim 30, Ogura discloses wherein the same connection configuration must be programmed on each of said sets of working channels on which traffic travels in the same direction as said first set of channels (see FIG. 6 and 11, the same working channels (where m=n) are used in clock/counterclockwise direction in East/west side of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claims 31 and 56, Ogura discloses wherein the same connection configuration must be programmed on the set of working channels of both sub-spans of any given one of said spans (see FIG. 6 and 11, the same working channels (where m=n) are used in clock and counterclockwise direction in East and west side of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claim 41, Ogura discloses wherein the same connection configuration must be provided on the working channels of every sub-span (see FIG. 6 and 11, working channels is always provided in the span), but said traffic handlers provide for a different connection configuration on the protecting channels (see FIG. 6 and 11, for SDH protection switching (i.e. APS switching), protection channels (where m<n or m>n) are different; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claim 44, Ogura discloses wherein each of said network elements participates as a node of said ring (see FIG. 1 and 17, Node A; and also see FIG. 4, SDH 2-fiber

ring optical multiplexing device), each node having stored therein the connection configuration (see FIG. 17, time slots/channels table, spans A-B and C-A) programmed on the working channels of at least every one of said plurality of spans not directly connected to that node (see col. 11, lines 52 to col. 12, lines 9; also see FIG. 20, traffic control table; see col. 15, lines 36-45).

Regarding Claims 47, Ogura discloses where said programming includes: each of said node, selecting from a storage (see FIG. 17, time slots/channels table, see col. 11, lines 52 to col. 12, lines 9; and see FIG. 20, traffic control table; see col. 15, lines 36-45) of the connection configurations of the working channels of each of said spans the connection configuration of the working channels programmed on said failed span ((see FIG. 4, a combined system of Receiving Control 11, transmitting control 12 and add/drop multiplexing 9 and 10 performs selection and switching; see col. 7, lines 6-12,20-45; see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; see col. 9, lines 5-65; during protecting switching, the working channels from the failed links are selected).

Regarding Claim 48, Ogura discloses storing, prior to said indicating, in each of said plurality of network elements information identifying the connection configurations of the working channels of each of the spans not directly connected to that network element (see FIG. 17, 2nd column of time slots/channels table, B-C, for remote span B-C not directly connected to node A; see col. 11, lines 52 to col. 12, lines 9; also see FIG. 20, traffic control table; see col. 15, lines 36-45).

Regarding Claim 49, Ogura discloses prior to said storing, between said plurality of network elements said information (see FIG. 11, command I is communicated between nodes; see col. 9, lines 48-65; see col. 12, lines 30-55).

Regarding Claim 51, Ogura discloses wherein the state prior to the protection switch includes a connection configuration programmed on the protecting channels of a first of said spans that does not mirror a connection configuration programmed on the working channels of said first span (see FIG. 6 and 11, the number of protection and working channels (where m<n or m>n) are different; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claim 65, Ogura discloses receiving, prior to said storing see FIG. 17, time slots/channels table, see col. 11, lines 52 to col. 12, lines 9; and see FIG. 20, traffic control table; see col. 15, lines 36-45), from said plurality of network elements said connection configurations (see FIG. 11, command I is received; see col. 9, lines 48-65; see col. 12, lines 30-55).

Regarding Claim 66, Ogura discloses receiving, at said node, a second message indicating a protection un-switch (see FIG. 11, second I command, see FIG. 20, V command; see col. 9, lines 48-65; see col. 12, lines 30-55; see col. 14, lines 20-45; SDH/SONET APS switching clear message); and responsive to said second message, reprogramming said receiving side of said first port to its state prior to the protection switch (see FIG. 6 and 11, due to SDH protection un-switching (i.e. SONET/SDH <u>reverted</u> APS switching), the channels used in clock/counterclockwise direction in East/west side of the network element would have been reverted into prior (to the failure) configuration; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

Regarding Claims 67 and 68, Ogura discloses wherein said reprogramming includes reprogramming the protecting channels on a receiving side of two ports of the node (see FIG. 4, O/E 1 and O/E 4) with different connection configurations (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; note that when the protection channels on receive side of ports utilizes two different connections (e.g. m<n or m>n) when a failure occurs/clears). Similarly, wherein said reprogramming responsive to said protection un-switch includes reprogramming the protecting channels on a receiving side of two ports of the node with different connection configurations (see FIG. 6 and 11, due to SDH protection un-switching (i.e. SONET/SDH <u>reverted</u> APS switching), the protection channels on receiver side of ports of the network element would have been reverted into prior (to the failure) configuration; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10).

4. Claim 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura in view of Wellbaum (US007016357B1).

Regarding Claim 9, Ogura discloses an apparatus (see FIG. 1) comprising:

a network element (see FIG. 1 and 17, Node A; and also see FIG. 4, SDH 2-fiber ring optical multiplexing device) coupled to a first (see FIG. 1, span between Node A and D on west side) and second span (see FIG. 1, span between Node A and B on east side) of a plurality of spans that interconnect a set of network elements (see FIG. 1, spans between Node A-D) to form a ring network (see FIG. 1, SDH 2-fiber ring optical network); see col. 5, lines 60-67; see col. 7, lines 1-30), each of said plurality of spans having two sub-spans (see FIG. 2 or 4; E/O 3 of transmit span and O/E 4 of receive span; see col. 6, lines 25-40; see col. 7, lines 20-25) on which

traffic travels in opposite directions (see FIG. 1, clockwise and counterclockwise; see col. 6, lines 41-57; see col. 7, lines 46-55), on a plurality of channels (see FIG. 1, Time slots TS#K) that circumvent said ring, each said plurality of channels including working channels and protecting channels (see FIG. 6, n and m time slots), said network element including a machine readable medium having stored thereon instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations including,

storing in a first set of structures (see FIG. 17, 1st and last column of time slots/channels table, spans A-B and C-A) connection configurations for the working and protecting channels programmed on the receiving side of the ports coupled to the sub-spans of the first and second spans (see col. 11, lines 52 to col. 12, lines 9; also see FIG. 20, traffic control table; see col. 15, lines 36-45); and

storing in a second set of structures (see FIG. 17, 2nd column of time slots/channels table, B-C, for remote span B-C not directly connected to node A) the connection configurations programmed on the working channels of those of said plurality of spans not directly connected to said node (see col. 11, lines 52 to col. 12, lines 9; also see FIG. 20, traffic control table; see col. 15, lines 36-45).

Ogura does not explicitly disclose concatenation. However, Wellbaum teaches storing (see FIG. 6, Concatenated time slot ID memory 815; see FIG. 9b-c, sub-memories parent and child; see FIG. 10-11, memory 1235) set of structures concatenation configurations (see col. 4, line 50-55; see col. 5, line 25-32, 45-60; see col. 7, line 34-35; storing concatenated configuration in the memory). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide concatenation, as taught by

Wellbaum in the system of Ogura, so that it would provide arbitrary concatenation without having to recognize a switch to have particular time slots; see Wellbaum col. 2, line 16-20.

Regarding Claim 10, Ogura discloses wherein said storing in said first set of structures includes storing one connection configuration for both of the working and protecting channels on the receiving side of both of the ports coupled to sub-spans of the first and second spans (see FIG. 6 and 11, for SDH protection switching (i.e. SONET/SDH APS switching), the same channels (where m=n) for both working and protection are used in clock/counterclockwise direction in both East and west side of the network element are stored in the table; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10.) Wellbaum discloses concatenation configuration as set forth above in claim 9. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide concatenation, as taught by Wellbaum in the system of Ogura, for the same motivation as stated above in claim 9.

Regarding Claim 11, Ogura discloses wherein said storing in said first set of structures includes storing one connection configuration for each of the working and protecting channels on the receiving side of both of the ports coupled to of the sub-spans of the first and second spans (see FIG. 6 and 11, for SDH protection switching (i.e. APS switching), the different channels (where m<n or m>n) for each working and protection are used in clock/counterclockwise direction in both East and west side of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10). Wellbaum discloses concatenation configuration as set forth above in claim 9. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide concatenation, as taught by Wellbaum in the system of Ogura, for the same motivation as stated above in claim 9.

Regarding Claim 12, Ogura discloses wherein said storing in said first set of structures includes storing one connection configuration for both of the working and protecting channels on the receiving side of each of the ports coupled to sub-spans of the first and second spans (see FIG. 6 and 11, for SDH protection switching (i.e. SONET/SDH APS switching), the same channels (where m=n) for working and protection are used in clock/counterclockwise direction in both East and west side of the network element are stored in the table; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10.) Wellbaum discloses concatenation configuration as set forth above in claim 9. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide concatenation, as taught by Wellbaum in the system of Ogura, for the same motivation as stated above in claim 9.

Regarding Claim 13, Ogura discloses wherein said storing in said first set of structures includes storing one connection configuration for each of the working and protecting channels on the receiving side of each of the ports coupled to of the sub-spans of the first and second spans (see FIG. 6 and 11, for SDH protection switching (i.e. APS switching), the different channels (where m<n or m>n) for each working and protection are used in clock/counterclockwise direction in East and west side of the network element; see col. 7, lines 35-60; see col. 9, lines 30 to col. 10, lines 10). Wellbaum discloses concatenation configuration as set forth above in claim 9. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide concatenation, as taught by Wellbaum in the system of Ogura, for the same motivation as stated above in claim 9.

Regarding Claim 14, Ogura discloses wherein said ring network is a modified bi-direction lines switched ring (see FIG. 6, a ring that switches lines in both East and West

(clockwise and counterclockwise) direction with channels m>n, m>n, or m=n; see col. 7, lines 42-63).

Regarding Claims 15 and 16, Ogura discloses a traffic handler (see FIG. 4, a combined system of Receiving Control 11, transmitting control 12 and add/drop multiplexing 9 and 10), to be coupled to said first and second set of structures (see FIG. 4, a combined system utilizes a table with data columns), to reprogram, responsive to protection switches and un-switches (see col. 7, lines 6-12,20-45; for SONET/SDH APS switching and <u>reverted</u> APS switching), the connection configurations for the protecting channels programmed on the receiving side of the ports coupled to of the sub-spans of the first and second spans (see col. 7, lines 42-63; see col. 8, lines 15-33; see col. 9, lines 35-42; note that when the protection channels are utilized (e.g. m<n or m>n) when a failure occurs/clears). Wellbaum discloses concatenation configuration as set forth above in claim 9. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide concatenation, as taught by Wellbaum in the system of Ogura, for the same motivation as stated above in claim 9.

5. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hermann (US006606667B1) in view of Kawaguchi.

Regarding Claim 17, Hermann discloses an apparatus (see FIG. 7) comprising:

a network element (see FIG. 7, Node A, B, C, or D) to be coupled to a first and second span (see FIG. 1, a span between Node A and D on west side and a span between Node A and B on east side) of a BLSR ring (see col. 7, lines 20; BLSR ring), said network element including,

means for providing different connection configurations on the protecting channels of said first and second spans responsive to protection switches and un-switches (see col. 7, lines 26-50,60 to col. 8, lines 30; also see col. 3, lines 20-65; setting different percentage of protecting channels/bandwidth in accordance with the traffic conditions).

Hermann does not explicitly disclose concatenations and where a different concatenation each to carry data for a single circuit at a greater bandwidth than that of data carried by a single component.

However, protection channels/time-slots carries one or more concatenations (e.g. STS-Nc) and wherein different connection configurations (e.g. STS-12c, where N=12) capable to identify different concatenations each to carry data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit) at a bandwidth greater (e.g.OC-12 line rate of 622.08 Mb/s) than that of data carried by a single component (e.g. single STS-1 (i.e. OC-1 at line rate 51.81 Mb/s)) is well known in the art of SONET/SDH standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein said different connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) capable to identify different concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c; see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10) each to carry data (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into one STS-48c, STS-24c, STS-12c, or STS3c circuit) with a bandwidth greater (see FIG. 8, greater OC-48 line rate at 2488.32 Mb/s, OC-24 line rate at 1244.16 Mb/s, OC-12 line rate at 622.08 Mb/s, and/or OC-13 line rate at 51.81 Mb/s) than that of data carried by a single component (see

FIG. 8, a single channel STS-1 (i.e. OC-1 at line rate 51.84 Mb/s)); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) of the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Hermann, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

Second set of rejection

6. Claim 1-5, 7, 17-23, 25-31, 33-34, 43, 46-48, 50, 52-61, 63-66, 68-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takatori et al (US Patent 5,600,631) in view of Kawaguchi.

With regard to claim 1 and 21, Takatori et al discloses node A (network element) that includes a controller (traffic handler) (column 5, lines 53-59 and column 6, lines 5863). As illustrated by Fig 3A, Takatori et al discloses lines pairs (plurality of spans) 30-1 and 31-1, 30-2 and 31-2, 30-3 and 31-3, and 30-4 and 31-4 that form a ring network (ring network / multiplexing ring transport network). Each node is connected to two lines pairs (first and second

span). In each lines pair (each of said plurality of spans), such as 30-1 and 31-1 (having two sub-spans), traffic travels in the clockwise and counterclockwise directions (traffic travels in opposite direction). Takatori et al further discloses a plurality of channels (plurality of channels) that include working (working channels) and protection (protecting channels) (column 7, lines 45-49 and 53-63). In the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig l A, the span-switching (protection switches / unswitches) is applied (column 6, lines 39-47).

Takatori does not explicitly disclose one or more concatenations and where a given concatenation of components is to collectively carry data for a single circuit at a greater bandwidth than that of data carried by a single component.

However, protection channels/time-slots carries one or more concatenations (e.g. STS-Nc) and where a given concatenation of components (e.g. STS-12c, where N=12) is to collectively carry data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit) at a greater bandwidth (e.g.OC-12 line rate of 622.08 Mb/s) than that of data carried by a single component (e.g. single STS-1 (i.e. OC-1 at line rate 51.81 Mb/s)) is well known in the art of SONET/SDH standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein a given connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) is to identify one or more concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c) of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) within the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10,

line 30 to col. 11, line 10), where a given concatenation of components (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) is to collectively carry data for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into one STS-48c, STS-24c, STS-12c, or STS3c circuit) at a greater bandwidth (see FIG. 8, greater OC-48 line rate at 2488.32 Mb/s, OC-24 line rate at 1244.16 Mb/s, OC-12 line rate at 622.08 Mb/s, and/or OC-13 line rate at 51.81 Mb/s) than that of data carried by a single component (see FIG. 8, a single channel STS-1 (i.e. OC-1 at line rate 51.84 Mb/s)); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) .

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Takatori, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

With regard to claim 2, 3, 4 and 5 in the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span-switching (protection switch I unswitch) is applied. The controller 28 controls the space division switch 7 to connect the signal to be received from protection lines 32-4 (first configuration) in place of working lines 30-4

(second configuration) (column 6, lines 3947). Prior to the failure the same configuration would have been applied to 32-4 and 304.

With regard to claim 7, 33, 43, 52, 63 and 69 Takatori et al discloses that the ring network is BLSR (bi-directional lines switching ring) (column 5, lines 11).

With regard to claim 17, Takatori et al discloses node A (network element) that includes a controller (column 5, lines 53-59 and column 6, lines 58-63). As illustrated by Fig 3A, Takatori et al discloses lines pairs (plurality of spans) 30-1 and 31-1, 30-2 and 31-2, 30-3 and 31-3, and 30-4 and 31-4 that form a ring network. Takatori et al discloses that the ring network is BLSR (BLSR ring) (column 5, lines 11). Each node is connected to two lines pairs (first and second span). In the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span switching (protection switches I unswitches) is applied. The controller 28 controls the space division switch 7 to connect the signal to be received from protection lines 32-4 in place of working lines 30-4 (different configurations) (column 6, lines 39-47).

Takatori does not explicitly disclose concatenations and where a different concatenation each to carry data for a single circuit at a greater bandwidth than that of data carried by a single component.

However, protection channels/time-slots carries one or more concatenations (e.g. STS-Nc) and wherein different connection configurations (e.g. STS-12c, where N=12) capable to identify different concatenations each to carry data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit) at a bandwidth greater (e.g.OC-12 line rate of 622.08 Mb/s) than that of data carried by a single component (e.g. single STS-1 (i.e. OC-1 at line rate 51.81

Mb/s)) is well known in the art of SONET/SDH standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein said different connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) capable to identify different concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c; see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10) each to carry data (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into one STS-48c, STS-24c, STS-12c, or STS3c circuit) with a bandwidth greater (see FIG. 8, greater OC-48 line rate at 2488.32 Mb/s, OC-24 line rate at 1244.16 Mb/s, OC-12 line rate at 622.08 Mb/s, and/or OC-13 line rate at 51.81 Mb/s) than that of data carried by a single component (see FIG. 8, a single channel STS-1 (i.e. OC-1 at line rate 51.84 Mb/s)); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) of the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Takatori, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS

concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

With regard to claim 18, the first and second spans disclosed by Takatori et al may have a different bandwidth (different sized connections).

With regard to claim 19 and 20, in the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span-switching (protection switches I unswitches) is applied. The controller 28 (hardware control means) controls the space division switch '7 to connect the signal to be received from protection lines 32-4 in place of working lines 30-4 (column 6, lines 39-47). A memory is inherent part of controller 28 as a memory is inherent to a processor. The usage of channels (concatenation) between nodes A and B is different (not programmed) from channel usage between A and D.

With regard to claim 22, Takatori et al further discloses a plurality of channels (plurality of channels) that include working (working channels) and protection (protecting channels) (column 7, lines 45-49 and 53-63).

With regard to claim 23, 25, 54 and 56, Takatori et al does not distinguish configurations among working channels (working channels) (column 7, lines 45-49 and 53-63).

With regard to claim 26 and 55, in the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span-switching is applied. The controller 28 controls the space division switch 7 to connect the signal to be received from protection lines 32-4 in place of working lines 30-4 (connection configurations programmed on the sets of working channels of two different ones of said spans differ) (column 6, lines 39-47). The use of working channels between nodes A and B is different from the use of working

channels between nodes A and D (connection configurations ... each of sub spans of at least one of said spans differ).

With regard to claim 27 and 28, each node is connected to two lines pairs. In each lines pair (spans), such as 30-1 and 31-1 (two different ones of said sub-spans I part of same one of said spans), traffic travels in the clockwise and counterclockwise directions. Takatori et al further discloses a plurality of channels that include working (working channels) and protection (column 7, lines 45-49 and 53-63).

With regard to claim 29, Takatori et al further discloses lines 30-4 and 30-1 (subspans part of two different ones of said spans) as illustrated by Figure 3A.

With regard to claim 30, Takatori et al discloses lines 30-1 and 32-1 (travels in same direction) as illustrated by Figure 7A. Takatori et al further discloses a plurality of channels that include working (working channels) and protection (column 7, lines 45-49 and 53-63).

With regard to claim 31, in each lines pair (spans), such as 30-1 and 31-1 (both sub-spans), traffic travels in the clockwise and counterclockwise directions. Takatori et al further discloses a plurality of channels that include working (working channels) and protection (column 7, lines 45-49 and 53-63).

With regard to claim 34, Takatori et al discloses node A (network element) that includes a controller (traffic handler) (column 5, lines 53-59 and column 6, lines 58-63). As illustrated by Fig 3A, Takatori et al discloses lines pairs (plurality of spans) 30-1 and 31-1, 30-2 and 31-2, 30-3 and 31-3, and 30-4 and 31-4 that form a ring network (multiplexing ring transport network). Each node is connected to two lines pairs (first and second span). In each lines pair (each of said plurality of spans), such as 30-1 and 31-1 (having two sub-spans), traffic travels in

the clockwise and counterclockwise directions (traffic travels in opposite direction). Takatori et al further discloses a plurality of channels (plurality of channels) that include working (working channels) and protection (protecting channels) (column 7, lines 45-49 and 53-63). In the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span switching (protection switch I unswitch) is applied. The controller 28 controls the space division switch 7 to connect the signal to be received from protection lines 32-4 in place of working lines 30-4 (column 6, lines 39-47).

Takatori does not explicitly disclose concatenations and where each of the concatenation of components carries data for a single circuit.

However, protection channels/time-slots carries different concatenations (e.g. STS-Nc) and where a different concatenation of two or more components (e.g. STS-12c, where N=12) carries data for a single circuit (i.e. concatenating twelve (12) STS-1 into one STS-12c circuit)) is <u>well known in the art of SONET/SDH</u> standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches wherein the connection configuration (see FIG. 2, switch trigger detection section 41, cross connect section 42, and path setting section 30) identify different concatenations (see FIG. 8, identifying STS-48c, STS-24c, STS-12c, and/or STS3c) of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) of the protecting channels (see FIG. 2, path-for-protection in Mch (protection) 30-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10), where each of the concatenation of components (see FIG. 8, concatenated STS-48c, STS-24c, STS-12c, and/or STS3c) carries data for a single circuit (see FIG. 8, concatenating 48, 24, 12, or 3 channels of STS-1 into <u>one</u> STS-48c, STS-24c, STS-12c, or

STS3c circuit); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62) .

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration of one or more concatenation of STS-1 path-for-protection channels where a concatenated STS-Nc (where N=3,12,24, or 48) is to collectively carry data for a signal STS-Nc circuit at greater bandwidth than a signal STS-1 channel component, where 155.52 Mb/s > 51.81 Mb/s, as taught by Kawaguchi in the system of Takatori, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

With regard to claim 46 and 64, in the case a failure occurs (responsive to a failure) in the working lines 30-4 and 31-4 between nodes A and B (plurality of network elements) as shown in Fig 7A, the span-switching (protection switch / unswitch) is applied. Takatori et al discloses node A (network element), that includes a controller (programming / reprogramming) (column 5, lines 53-59 and column 6, lines 58-63). As illustrated by Fig 3A, Takatori et al discloses lines pairs (spans) 30-1 and 31-1, 30-2 and 31-2, 30-3 and 31-3, and 30-4 and 31-4 that form a ring network (ring). Each node is connected to two lines pairs (first and second span). In each lines pair (each of said plurality of spans), such as 30-1 and 31-1 (sub-spans), traffic travels in the clockwise and counterclockwise directions (opposite direction). Takatori et al further

discloses a plurality of channels (plurality of channels) that include working (working channels) and protection (protecting channels) (column 7, lines 45-49 and 53-63).

Takatori does not explicitly disclose a combination of a signal component, and a concatenation of two or more components or a combination of multiple concatenations of tow or more components, where each concatenation carries data for a different single circuit.

However, protection channels/time-slots carries a combination of a signal component (e.g. a single STS-1), and a concatenation of two or more components (e.g. STS-12c, where N=12 (i.e. 12 STS-1 channels/components)) or a combination of multiple concatenations of two or more components (e.g. two concatenate STS-12c, each contains 12 STS-1 channels/components), where each concatenation carries data for a different single circuit (e.g. 1st concatenated STS-12c carries first OC-12 circuit, and 2nd concatenated STS-12c carries second OC-12 circuit) is <u>well known in the art of SONET/SDH</u> standards (GR-253-CORE; sections 3.1 and 3.2.3). In particular, Kawaguchi teaches a combination of a signal component (see col. 6, line 55 to col. 7, line 44; a single STS-1); see col. 6, line 55 to col. 7, line 44; see col. 9, line 20-56; see col. 10, line 30 to col. 11, line 10; and a concatenation of two or more components (see FIG. 8, at least two STS-1 channel (i.e. concatenated STS-3c has three STS-1 channels/components) or a combination of multiple concatenations of two or more components (see FIG. 8, two STS-48c, four STS-24c, eight STS-12c, and thirty-two STS-3c, each contains at least three STS-1 channel/components), where each concatenation carries data for a different single circuit (see FIG. 8, each STS-48c, STS-24c, STS-12c, and STS-3c carries OC-48,OC-24,OC-12 and OC-3 circuit, respectively); see col. 12, line 60 to col. 13, line 14,54-60; see col. 16, line 4-10; see col. 17, line 45-62.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide cross-connecting configuration identifies a signals STS-1 channel/component and a concentration of three or more STS-1 channel/components in STS-Nc (where N= N=3,12,24, or 48), or a combination of multiple STS-Nc with each STS-Nc has at least three STS-1 channel/components, where each STS-Nc carries data for its corresponding STS-Nc circuit, as taught by Kawaguchi in the system of Takatori, so that it would provide a cross connect system which provides to select and switch a signal with better quality through the use of line setting/configuration in the memory, thus diminishing power consumption; see Kawaguchi col. 3, line 29-34; by configuring STS concentration according to SONET/SDH standard, it would enable the network service provider to interoperate its equipment/network with others providers' equipment/networks.

With regard to claim 47, Takatori further discloses a plurality of channels that include working (working channels) and protection (column 7, lines 45-49 and 5363). In the case a failure occurs (on said fail) in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span-switching (protection switch I unswitch) is applied. Takatori et al discloses node A that includes a controller (selecting ,.. configuration) (column 5, lines 53-59 and column 6, lines 58-63).

With regard to claim 48, Takatori et al discloses node A (network element) that includes a controller (identifying information) (column 5, lines 53-59 and column 6, lines 58-63).

With regard to claim 50, in the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span-switching (protection switch I unswitch) is applied.

With regard to claim 53, Takatori et al further discloses a plurality of channels that include working (working channels) and protection (column 7, lines 45-49 and 5363).

With regard to claim 65, Takatori et al discloses node A that includes a controller (storing/storage) (column 5, lines 53-59 and column 6, lines 58-63). A memory is inherent part of controller 28 as a memory is inherent to a processor.

With regard to claim 61 and 66-68, in the case a failure occurs (second message) in the working lines 30-4 and 31-4 between nodes A and B (plurality of network elements) as shown in Fig 7A, the span-switching (protection switch /unswitch) is applied. Takatori et al further discloses a plurality of channels that include working (working channels) and protection (protecting channels) (column 7, lines 45-49 and 53-63).

7. Claims 6-9, 11-16, 42, 44 and 45 are rejected under 35 U.S.C. 103(x) as being unpatentable over Takatori et al (US Patent 5,600,631) in view of Kawaguchi, as set forth above, and further in view of Lu (US Patent 5,815,490).

With regard to claims 6, 8, 42, 44 and 45, neither Takatori nor Kawaguchi explicitly disclose a first set of structures to store and a second set of structures to store. Lu discloses a ring-provisioning table (table generator / first and second structures for storing) for the clockwise working channels 1-8 of a 4-node two fiber BLSR as illustrated by figures 5 and 6 (column 9, lines 58-61). Figure 6 shows the particular provisioning of one-way normal traffic that is carried by the clockwise working channels in the left to right directions (column 9, lines 66 -column 10, lines 4). Accordingly, both the direct and indirect connections are stored in the table.

A person of ordinary skill in the art would have been motivated to employ Lu in the combined system of Takatori et al and Kawaguchi to because the multiplexing structure of the SDH ring table should be used for high order path management that is especially advantageous to manage ATM traffic (column 10, lines 4-9). At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains so as to obtain the invention as specified in claims 8 and 42.

With regard to claim 9, Takatori et al discloses node A (network element) that includes a controller (processor) (column 5, lines 53-59 and column 6, lines 58-63). As illustrated by Fig 3A, Takatori et al discloses lines pairs (plurality of spans) 30-1 and 311, 30-2 and 31-2, 30-3 and 31-3, and 30-4 and 31-4 that form a ring network (multiplexing ring transport network). Each node is connected to two lines pairs (first and second span). In each lines pair (each of said plurality of spans), such as 30-1 and 31-1 (having two sub-spans), traffic travels in the clockwise and counterclockwise directions (traffic travels in opposite direction). Takatori et al further discloses a plurality of channels (plurality of channels) that include working (working channels) and protection (protecting channels) (column 7, lines 45-49 and 53-63).

Neither Takatori et al nor Kawaguchi, however, expressly disclose a first set of structures to store and a second set of structures to store. Lu discloses a ring-provisioning table (first and second structures for storing) for the clockwise working channels 1-8 of a 4-node two fiber BLSR as illustrated by figures 5 and 6 (column 9, lines 58-61). Figure 6 shows the particular provisioning of one-way normal traffic that is carried by the clockwise working channels in the left to right directions (column 9, lines 66 - column 10, lines 4). Accordingly, both the direct and indirect connections are stored in the table.

A person of ordinary skill in the art would have been motivated to employ Lu in the combined system of Takatori et al and Kawaguchi to because the multiplexing structure of the SDH ring table should be used for high order path management that is especially advantageous to manage ATM traffic (column 10, lines 4-9). At the time the invention was made, therefore, it would have been obvious to one of ordinary skill in the art to which the invention pertains so as to obtain the invention as specified in claim 8.

With regard to claim 11, 12 and 13, as illustrated by Figure 6, the provisioning ring table stores working channel assignments for each node (column 9, lines 58-66). A similar table can be used for protecting channels.

With regard to claim 14, Takatori et al discloses that the ring network is BLSR (bi-directional lines switching ring) (column 5, lines 11).

With regard to claims 15 and 16, Takatori et al discloses node A that includes a controller (traffic handler) (column 5, lines 53-59 and column 6, lines 58-63). In the case a failure occurs in the working lines 30-4 and 31-4 between nodes A and B as shown in Fig 7A, the span-switching (protection switches I unswitches) is applied. The controller 28 controls the space division switch 7 to connect the signal to be received from protection lines 32-4 (first configuration) in place of working lines 30-4 (second configuration) (column 6, lines 39-47).

Allowable Subject Matter

8. **Claims 57-61 and 63** are allowed.

9. **Claims 24 and 32** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

10. Applicant's arguments with respect to claims 1-23,25-31,33-56, 64-69 has been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N. Moore whose telephone number is 571-272-3085. The examiner can normally be reached on 9:00 AM- 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 571-272-7629. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

INM
3-31-06

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